

### **REMARKS/ARGUMENTS**

Reconsideration of this application is requested. Claims 1-18 will be pending in the application subsequent to entry of this Amendment.

#### **Discussion of Amendments to the Claims/New Claim**

The claims have been amended in order to more particularly point out and distinctly claim that which applicants regard as their invention and to address the rejections stated in items 8-12 of the Official Action. The claims have been revised to replace the European-style "use of ..." to methods of preparing a particulate material of the type defined derived from mammalian hair. This applies to claims 1-14. Claims 15-17 have been cast in product-by-process expressions.

New claim 18 has been added which incorporates revised claim 1 and specifies that the cellulose fibers are mixed or replaced with at least 20% by weight of the particulate material derived from mammalian hair (this is discussed in further detail below).

Independent claim 1 is above amended to specify that in step (a) the hair is contacted with the alkaline (*see* claims 6 and 7) or acidic (*see* claims 8 and 9) solution over a period of time in the range of from 5 minutes to 16 hours. Basis for this amendment can be found in the international publication, page 3, lines 8-10.

With regard to new independent 18, please consider the following:

Page 7, lines 12-17 of the international publication discusses the stretch at break for paper sheets containing various amounts of processed hair fibers.

With regard to the amount of cellulose replacement with the particulate mammalian hair-based product of the present invention, Figure 5 of the application shows that at concentrations of 20 % or more the stretch at break surprisingly increases. This, in combination with the teachings on page 2, lines 4-6 and page 5, lines 17-19 is featured in new independent claim 18 directed to paper or paperboard in which at least 20 % (w/w) of the cellulose fibers are substituted by the particulate material.

#### **Response to Claim Clarity Rejections**

In the discussion bridging pages 5 and 6 of the Official Action, the examiner questions the meaning of the terms "paper" and "paperboard" products. Paper and a paperboard are well-known terms to the person skilled in the art of papermaking. Whereas paper generally refers to

sheets that are produced by pressing together moist fibers and drying them, paperboard refers to sheets that are also made from paper pulp, but are thicker than paper. Paperboard is a relatively stiff and heavy material. Normally paperboard is made from layers of compressed paper.

For the above reasons it is respectfully submitted that the formalities/claim clarity/statutory subject matter issues raised in items 8-12 have been resolved, that basis for the new or amended claims adequately explained in the above remarks and that there is no added subject matter being claimed. Withdrawal of the objections/rejections in items 8-12 is solicited.

#### **Response to Prior Art-Based Rejections**

Items 13-17 set forth a series of "obviousness" rejections directed to various combinations of the originally filed claims. To the extent that these rejections may be considered to pertain to the new and amended claims presented above, they are respectfully traversed. Response will be prepared directed primarily to the combination of Anders and Muller as the nature of the alkaline or acidic solution containing a bleaching agent has been further specified as well as the processing time in the amendments to claim 1 which are carried through to new claim 18 and are further specified in claims 6-9.

The subject-matter of the claims as above amended is novel and non-obvious over the cited prior art for the following reasons.

The present inventors found that the particulate material derived from mammalian hair as provided in the present claims can advantageously be used to substitute cellulose fibers in the preparation of paper and paperboard products. Accordingly much less cellulose fibers need to be used in the preparation of paper and paperboard products, thereby reducing deforestation.

In addition, the inventors found that when cellulose fibers in the preparation of paper and paperboard products are substituted with the particulate material described in the present invention to a minimum level of 20 wt.% -- as featured in new claim 18 -- that the stretch at break of the resulting paper sheet surprisingly increases.

**Anders** teaches a process of treating hair, wherein the hair material is bleached for about 24 hours at 80 °F (27 °C) in preferably an eight volume hydrogen peroxide bath to which sufficient ammonia is added to bring the bath to proper alkalinity (Anders, page 1, lines 76-80). Hence, Anders fails to teach or suggest an oxidizing treatment of 5 minutes to 16 hours.

**Muller** teaches bleaching of animal fibers, wherein rabbit hair stumps are put into a weakly acid bleaching solution containing 1 percent hydrogen peroxide and 1 percent potassium alum. The rabbit hair stumps are treated in the bath for 24 hours at 30 °C (Muller, page 1, lines 61-69). Hence, Muller fails to teach or suggest an oxidizing treatment of 5 minutes to 16 hours.

None of the prior art documents teaches or suggests an oxidizing treatment of 5 minutes to 16 hours -- in particular not in relationship with the preparation of paper or paperboard products.

Applicants note that the two documents which are held relevant to the hair treating process date from 1920 and 1931, respectively. Apparently, in the long time period since 1931 to 2004 no skilled person has considered a considerable shorter oxidizing treatment as provided by the present invention, let alone to the process animal hair in a papermaking process. This enormous time period clearly strongly indicates that the present invention is not obvious.

Moreover, it is noted that none of the cited prior art documents suggest or teach the increase in stretch at break that is achieved by the present invention. Although **Akitaro et al** describe a process for making paper sheets in which animal hair fiber pieces are mixed with cellulosic fiber at a ratio of 85:15 - 10:90, there is no teaching or suggestion that the substitution of at least 20 % w/w of cellulosic fibers with particular material derived from mammalian hair, which has been subjected to an oxidation treatment for 5 minutes to 16 hours, would increase the stretch at break of the resulting paper sheet.

For the above reasons it is respectfully submitted that all pending claims define subject matter that is novel and inventive over the applied references.

**Provisional Obviousness-type Double Patenting Rejections**

The Official Action also includes two *provisional* obviousness-type rejections based on two pending, commonly assigned U.S. patent applications; *see* items 5-7 of the Official Action. As both of these rejections are provisional applicants will hold in abeyance any specific response to either of these two rejections. At such time as allowable subject matter is indicated one or both of these provisional rejections will then be addressed. Counsel also notes that the claims in this application have been substantially amended and clarified rendering moot one if not both of these provisional rejections.

**Discussion of Existing Information Disclosure Statement**

Regarding the Information Disclosure comments on page 2, items 3-4 of the current Action, attached are copies of the Abstracts of published Japanese applications JP 2002-194693A and JP 2001-214400A. These are listed based on the database WPI documents furnished with the International Search Report and copies of these Derwent Abstracts of the two published Japanese applications are attached to this response. Counsel has the understanding that submission of these two documents "for the case file" as requested in item 4 of the Official Action will thus be satisfied since the documents in question are, in fact, Derwent Abstracts of the documents just mentioned.

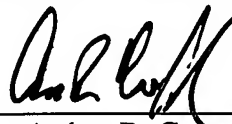
Attached also is a PTO/SB/08a listing these two documents as they were listed in the International Search Report in the underlying international application. Counsel believes that no additional formal "IDS" submission, with fee, will be necessary according to counsel's understanding of the examiner's comments in item 4 of the Official Action. However, applicants do wish to have these two documents officially listed and appear on the face of the patent to be issued on this application – particularly since the examiner has considered them. Should the examiner have requirements different from those understood above, then please contact the undersigned and they will be resolved promptly.

For the above reasons it is respectfully submitted that the claims of this application define inventive subject matter. Reconsideration and allowance are solicited. Should the examiner require further information, please contact the undersigned.

Respectfully submitted,

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